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Frank A. Cook

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NOTES ET NOUVELLES

Geographical Branch Studies in Periglacial Geomorphology *

The study of periglacial phenomena is a comparatively new form of research in Canada. Prior to 1950, physical scientists working in northern Canada had published only isolated observations on the more spectacular forms such as pingos, polygons and solifluction. It was not, however, until the rediscovery of the north about a decade ago that any systematic reporting of periglacial phenomena began.

The Geographical Branch of the Department of Mines and Technical Surveys was created in 1947 (1) and included in its terms of reference the responsibility of collecting and analyzing geographical knowledge on northern Canada. The establishment of the northern meteorological stations (2) resulted in improved communication and transportation, giving geographers an opportunity to conduct reconnaissance studies over wide areas. Since then field parties have carried out surveys over wide areas in the Arctic and Subarctic, from the northern coast of Ellesmere Island to the Hudson Bay coastal plain in Ontario, and from the Alaska boundary to Labrador (3). The early field reports of these surveys contain many references to periglacial phenomena. However, it is only recently that systematic studies have been undertaken and work has been published in the field of periglacial geomorphology.

This work has been concentrated almost entirely on active forms, chiefly permafrost and patterned ground. This is in sharp contrast to studies in most European countries, as in Poland, for example, where periglacial study is well advanced and concentrated almost exclusively on fossil forms such as involutions and ice wedges.

In 1950 Washburn published his well known paper on patterned ground (4). This paper has had considerable influence on the periglacial research of the Geographical Branch, as it coincided with the movement of geographers into new areas where patterned ground was especially well developed.

Apart from published reports which include some reference to periglacial phenomena and processes (5, 6, 7, 8, 9) a number of special studies have been published incorporating work carried out both in the office and in the field, under auspices of the Geographical Branch. The first such work discussed the origin and distribution of permafrost, with special reference to Canada (10). Temperature regimes in permafrost at Resolute Bay, Cornwallis Island, N.W.T., especially in the active layer, were examined (11, 12) as well as the distribution and structure of fissures and circles in the same area (13, 14, 15). Freeze-thaw frequencies and mechanical weathering in Canada were studied and it was concluded that the importance of freeze-thaw cycles may be overemphasized. The fact that frost-riven rock is more evident in northern than in southern Canada may not be the result of lower temperatures or freeze-thaw cycles, but rather of the absence of a concealing and insulating mantle of snow and vegetation (16). A subsurface organic layer associated with permafrost in the western Arctic came under consideration, and it was postulated that it was not formed as part of tundra soil development, in the pedologic sense, but resulted from progressive burial of the organic tongues that extend downward in the depressions

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between hummocks. These organic layers develop slowly, probably over a period of thousands of years (18). Vegetation arcs in tundra regions, specifically in the area to the north and west of Great Bear Lake, and on Cornwallis Island, District of Franklin, were described (19).

The problem of the age of felsenmeer, or mountain-top detritus, in the Torngat Mountains, northern Labrador, was studied and it was concluded that it dated from late in the Torngat glaciation when thinning of the ice had exposed the upper surfaces to frost action (20, 21, 22). The composition and formation of polygonal soil in the region of Flœberg Beach, northern Ellesmere Island, was discussed (23). An outline for field observations of patterned ground was published (24) and a short photographic study of selected patterned ground types in Canada prepared (25). A total of 1,380 pingos were located and examined on aerial photographs for the area east of the Mackenzie delta, and a classification of the pingos into distinct types attempted (26). A large scale map was published showing details of many periglacial forms in the region of Mould Bay, Prince Patrick Island. This was the first map of this type compiled in Canada (27). Frost-shattering and solifluction were among the erosive forces discussed in the development of the physiography of the western Canadian Arctic (28). The name of finger-print bogs was suggested for a type of string bog documented by aerial and ground photographs on King William Island and Adelaide Peninsula, N.W.T. (29). A regional monograph is in press on the south-eastern part of Cornwallis Island. This publication will be the first regional study in Canada in which periglacial factors are considered as functioning as a system of erosion rather than as an individual phenomenon or process (30).

In 1958 a long-term program for the study of periglacial phenomena and processes was set up in the Geographical Branch. The first phase, now completed, concerned the status of the study of periglacial phenomena in Canada (3) ; the abstracting from reports and published literature of all pertinent information on periglacial phenomena and processes for filing on punch cards ; and the publication of annotated bibliographies (32, 33). The second phase includes the preparation of a glossary of periglacial terms, with illustrations of the various phenomena, for the purpose of standardizing field procedures and clarifying the nomenclature used within the Geographical Branch. The third phase will develop a program for the future study of periglacial phenomena and processes. It is proposed to carry on field research on a long-term basis in the Resolute Bay area, as well as to establish shorter-term projects elsewhere.

It is hoped with a developing plan for the study of periglacial geomorphology in Canada, that close liaison can be established with the French-speaking geographers of Canada working in that field (notably the Laval University group), as well as with the Commission on Periglacial Geomorphology of the International Geographical Union.

Frank A. Cook,
Geographical Branch, Ottawa.

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La commission du périglaciaire au Maroc en 1959 [1]

L'une des commissions les plus actives de l'Union géographique internationale est bien celle de géomorphologie périglaciaire, commission créée au Congrès de Lisbonne en 1949 et actuellement dirigée par MM. Jan Dylik, de Lodz, Pologne et René Raynal, de Rabat, Maroc. Grâce à eux, la Commission a continué à être très active ; elle aura été, pendant son mandat, l'un des plus importants facteurs du développement des recherches périglaciaires dans le monde. Les rencontres entre chercheurs ont été facilitées ; la Commission a renforcé sa structure par la nomination de membres « nationaux », notamment en U.R.S.S., aux États-Unis et au Canada ; des réunions nationales ont été organisées ; les travaux se sont multipliés non seulement sur les pays arctiques mais sur des régions antarctiques, montagneuses et même tempérées ; certains chercheurs se sont même intéressés aux processus périglaciaires dans les climats où le froid ne joue que d'une façon secondaire et associée ; un certain nombre de fiches bibliographiques a été préparé ; d'autres cartes nationales ont vu le jour ; on a apporté d'intéressantes contributions aux phénomènes périglaciaires antérieurs au Wurm, par exemple en Pologne ; le périglaciaire a fait aussi des progrès tant sur le plan méthodologique (stratigraphique et sédimentologique) que sur celui de l'étude quantitative de certains phénomènes. Les efforts spécifiques de la Commission vont se traduire au Congrès de Stockholm en 1960 par la présentation des premières cartes périglaciaires à l'échelle mondiale.

La dernière réunion de la Commission qui s'est tenue au Maroc du 19 octobre au 1er novembre comportait trois parties, d'ailleurs comme la précédente qui avait eu lieu en Pologne l'année précédente : un symposium, des réunions d'affaires et une grande excursion.

Communications. Dix étaient inscrites au programme des deux séances prévues à cette fin à Rabat. Faute de temps, elles n'ont pas toutes eu lieu. La majorité des travaux se rapportaient à des phénomènes périglaciaires nationaux : Maroc, U.R.S.S., Pologne, Elzbourg, montagnes d'Europe centrale. Pour notre part, à la séance de Chechaouane, nous avons présenté l'édition préliminaire de la *Selected bibliography on periglacial phenomena in Canada. Annotations and Abstracts*, liste critique préparée par M. Frank A. Cook et à paraître en 1960 dans les *Bibliographical Series* du *Geographical Branch*, du ministère des mines et des relevés techniques, Ottawa, Canada. En dehors de ces textes régionaux, d'autres, généraux, se rapportaient notamment aux glaces. La plupart des travaux qui ont fait l'objet d'une communication formelle apparaîtront dans le numéro 7 du *Biuletyn Peryglacjalny*, Lodz, Pologne, 1960.

[1] L'auteur de cette note manifeste sa profonde gratitude à l'université Laval et à l'Union géographique internationale pour lui avoir permis d'assister, en octobre 1959, à la réunion de la Commission de géomorphologie périglaciaire au Maroc. Nous voulons rendre également un très vif témoignage d'admiration à nos collègues du Maroc, notamment à M. René Raynal, pour leurs recherches et pour l'organisation parfaite de la réunion de la Commission. À ces assises, nous étions délégué de l'Association canadienne des géographes.